LINCOLN NATIONAL FOREST

MONITORING AND EVALUATION REPORT

Fiscal Year 98

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Fiscal Year 98

Forest Supervisor's Certification the Plan is Sufficient

The Lincoln National Forest was scheduled to begin Plan Revision during fiscal year 98 and complete it by 2001. However, due to pending new congressional direction, this schedule was altered and Forest Plan Revision processes have been postponed.

One new Plan amendment may result from the Sacramento River Road Environmental Impact Statement (EIS).

Plan Amendment Needs

Since implementation of the Lincoln's Land and Resource Management Plan in 1986, four corrections and nine amendments have been completed, including the Southwestern Region "Final Environmental Impact Statement, For Amendment of Forest Plans", to incorporate Mexican spotted owl and Northern goshawk management direction.

Changing social conditions in and around the community of Timberon, New Mexico, prompted the Lincoln to submit a Forest highway proposal to the Federal Highway Administration to improve the surface and location of the Sacramento River Road. The proposal was accepted, is being analyzed in an Environmental Impact Statement, and may result in a Forest Plan amendment. Other changes were identified during this monitoring and evaluation cycle, but are most appropriately addressed during Forest Plan Revision, as discussed in the following section.

Forest Plan Changes Needed at Plan Revision

Human Dimension - A number of trends are occurring in the Southwest that affect Forest Plan direction, goals, and objectives. Demographics are shifting to an older-aged population, and there will be a continually increasing influx of people of all ages from outside the area. This trend includes an overall transition from a public which desires emphasis on commodity-oriented products and services, to a public that wants programs and program delivery to be amenity-oriented. Results of this shift will include an increase in the kind and number of recreational opportunities, accessibility to all publics, and an ever-increasing sensitivity to macro- and micro-environmental issues.

The existing Forest Plan does not adequately reflect this social trend. Although Plan implementation has been flexible in meeting many of society's changing needs, an increase in administrative appeals and litigation demonstrates that Plan direction can be improved to guide resolution of many of these issues. Plan Revision will assess this situation, and these issues will be addressed at that time.

Specific human dimension program areas needing analysis and possible modification at Plan Revision are:

Transportation System
- What roads and trails will be available for public use or additional resource needs?
- What uses will be allowed and are we considering all uses to protect resources?
- What rights-of-way are needed?

Public land use, land exchanges, and special uses

Allowable Sale Quantity of wood products

Recreation Opportunities
- Are our developed recreation sites adequate in kind and number?
- Is our variety and number of dispersed recreation opportunities adequate?
- What are our existing and future maintenance obligations?

Heritage Resource Management
- What National Register sites established since 1986 need to be incorporated?
- What standards and guidelines developed since 1986 need to be incorporated as appropriate?

Physical/Biological Dimensions - The evolution toward an ecosystem management approach has refocused the Lincoln's sensitivity to ecological issues at the landscape level. Coupled with human dimension trends, this situation has brought needed Plan modifications to the forefront. Foundation concepts upon which Plan Revision will be built include: 1) an increase in the number of listed threatened and endangered plants and animals, 2) an increase in knowledge of the function, processes, and interrelationship of ecosystems, and 3) a recognition that thresholds exist beyond which those ecosystems may no longer be sustainable.

Specific Plan modifications to be considered during Plan Revision are:

Watershed
- Ecological objectives need to be strengthened.
- Proper functioning conditions need to be identified.
- Standards and guidelines need to be clear and achievable.
- Water rights need to be more clearly addressed.
- Riparian management needs to be more clearly addressed.

Fire
- Natural fire needs to be brought back into appropriate ecosystems.
- Prescribed natural fire needs to be more clearly addressed.
- Wildland-urban interface needs to be emphasized.

Range and Wildlife
- Elk and livestock management needs to be re-assessed.

Noxious weeds
- Accomplishments need to be incorporated.

Forest health
- Areas with more urgent resource needs should be identified.
- Tools to address resource needs should be strengthened.

TE&S plants and animals
- Consider continuation of single-species management.
- Keeping plants and animals from becoming threatened or endangered needs to

continue.

- Plans for a more efficient recovery of various species needs to be coordinated.

Summary of Monitoring Activities Including What We Learned and What We Are Doing About It.

Ongoing Monitoring

Ongoing monitoring efforts covering administration and operational activities, baseline inventories, implementation, effectiveness, and validation monitoring have been summarized below. This section is a continuation of last year's documentation efforts and includes past and present monitoring information and ongoing activities.

The table below is an excerpt from the GAO Study Report dated February of 1998. Documented monitoring activities have been summarized by monitoring type and fiscal year. Detailed summaries of these activities can be found in Appendix A.

Number of Monitoring Activities* by Type, by Year

Year	*Baseline*	*Implementation*	*Effectiveness*	*Validation*	*Total*
1993	14 (2)	45 (8)	33 (9)	0	92 (19)
1994	16 (2)	28 (9)	55 (7)	0	99 (18)
1995	27 (2)	58 (15)	34 (13)	5 (1)	124 (31)
1996	44 (3)	65 (16)	49 (6)	2 (0)	160 (25)
1997	30 (2)	85 (22)	19 (3)	5 (1)	139 (28)
Totals	131 (11)	281(70)	190(38)	12 (2)	614(121)

* Forest health related monitoring activities appear in parentheses

Administrative/Operational - The Supervisor's Office Staff provides oversight and quality control in approval of Biological Assessment and Evaluations (BA&E's) for Forest Supervisor decisions, and all heritage resource clearances. The Forest's key contact list is reviewed and updated at least annually.

Hazardous waste was discovered in Panama Cave. The Forest monitored the contractor for proper equipment and waste disposal. Additional monitoring will include testing contaminant levels, posting warning signs and monitoring bat habitat. This situation has led us to survey other caves for potential dump sites.

Road conditions are monitored by the engineering department and district personnel. Condition surveys contain the necessary documentation to schedule maintenance, closures, and obliteration. Road obliteration is monitored for effectiveness. Road, bridge, and dam maintenance monitoring is ongoing. Much of the monitoring is done on an informal basis.

The Lincoln's Facilities Master Plan contains guidance for inspecting all facilities, resulting in actions needed to remedy problems identified.

Recreation technicians and campground hosts provide feedback from the public. For example, the stay limit was changed in the campgrounds based upon public input. Ski Apache is monitored via the snow ranger. Other operational monitoring results are provided by wilderness patrols, road and

trail sign inspectors, and trail volunteers. Permitted-use sites such as electronic sites are inspected periodically. Cave volunteers are inspecting and reporting cave conditions.

Unit safety reviews are conducted annually and include wildfire response readiness and aircraft checks.

Baseline/Inventories - Air quality baseline information for the Tularosa Basin has been collected for three years using photo comparisons from a permanently mounted camera in the White Mountain Wilderness.

Stream cross-sections and proper functioning conditions are being collected for the Rio Penasco. To determine attainment of designated State water quality uses, baseline and existing condition information for Fresnal and La Luz Canyons are being collected in cooperation with the New Mexico Environment Department. Proper functioning conditions of watersheds within the Sid West area were conducted. Rio Ruidoso water quality information is being collected to support possible improvements in the Ski Apache area parking lot. Last Chance Canyon sites were monitored for proper functioning conditions and visual effects to assess changes in management. In cooperation with the New Mexico Environment Department, the Lincoln identifies existing and potential non-point source water pollution on National Forest system lands. Water quality monitoring is coordinated and results are shared. These monitoring and cooperative efforts have resulted in Clean Water Act 319 grants for watershed improvement on Forest Service lands (e.g. the work in the Fresnal and La Luz Canyons mentioned above).

Vegetation data is being collected for each ranger district. This information is being used to determine existing conditions for support to wildland-urban interface and forest health projects, salvage sales, Mexican spotted owl thresholds at the landscape level, and Forest Plan Revision preparation. Approximately forty-five thousand acres were surveyed to determine vegetative conditions. Photo and video plots documenting visual and vegetation conditions have been recorded on maps and tracked in the RMRIS database and GIS. Photo history is also used to document damage to cave formations, and identify restoration work.

Threatened, endangered, and sensitive species are surveyed for project and program monitoring requirements (e.g. Mexican spotted owl recovery plan), as well as to provide planning information during project analysis. Key species were surveyed in 1998.

Range conditions are being resurveyed on the Sacramento Allotment winter and summer range to help resolve use-level issues.

Excavation and core drilling in caves have allowed the Forest to analyze prehistoric bone and pollen material. Results will provide information on presettlement vegetation and fire regimes. Heritage resource surveys are conducted to locate historic and prehistoric sites (per Section 110, National Historic Preservation Act). Many of these surveys are carried out under the Passports in Time Program, giving the public an opportunity to participate.

Implementation - Periodic field visits to project areas normally result in informal monitoring and evaluation of actions needed. Documentation is often captured on the Forest monitoring forms. The forms have been summarized and can be found in Appendix A.

Recreation facility construction projects include post-occupancy reviews to ensure contract work meets specifications and EA requirements. They are monitored to determine how well the design has met the needs of users. Such reviews were performed at Three Rivers Campground and Haynes Vista.

Sikes program projects are monitored after completion and are put on an annual monitoring schedule. They are visited annually to check implementation work and sometimes photographed to document project effectiveness.

Fuelwood monitoring includes field checks for "leave" trees and an assessment of public harvesting. Information learned from monitoring is applied to fuelwood area cleanup efforts. Cleanup efforts are also monitored. Site visits are often documented on Forest monitoring forms. Recommendations and actions by the person monitoring are normally documented. Precommercial thinning and salvage sale activities include post-sale inspections. Areas are examined to ensure contract requirements are met, and the results are documented in the RMRIS database.

Effectiveness - Monitoring is done after road closure or road obliteration to determine if methods used were effective. Documentation can be found in the daily maintenance logs. This information and district feedback is evaluated, and changes to closure or obliteration techniques are determined.

Both known and potential locations of threatened, endangered, and Forest Service designated sensitive plant species are monitored. When a species is present, monitoring is done both before and after management activities.

Forest monitoring forms are used to document damage, erosion, and changed conditions for prerecorded heritage resource sites.

Vegetation treatments, including Christmas tree cutting, receive post-treatment monitoring to assess their effectiveness. Areas of natural regeneration are also inspected for rate of success.

Prescribed fire treatments are monitored through site visits. How well objectives have been met (i.e. reducing canopy cover of the pinyon-juniper and increasing forbes) is evaluated and documented. Recommendations and follow-up actions are determined.

A portion of the Forest's completed projects are inspected to verify flagged archaeological sites are avoided. In addition, sites are periodically inspected to monitor conditions and to ensure they were protected by previous projects. Site monitoring forms are kept on file.

Validation - The Forest is validating data manipulation assumptions used for RMRIS stand information, Mexican spotted owl recovery plan information, and information used in the Southwestern Region Plan Amendment. In cooperation with Northern Arizona University, the Forest is testing various land stratification schemes for entry into the SPECTRUM model. Other

data relationship testing includes Mexican spotted owl threshold conditions and old-growth attributes. For other validation monitoring, see "Research Needs" section.

Forest Plan Chapter 5 (Monitoring Plan) - Very little formal evaluation and documentation has been completed for monitoring items identified in Chapter 5 of the Forest Plan. However, many existing operational processes and accounting systems gather information that is applicable to items identified in Chapter 5.

FY98 Progress

Most of our monitoring is documented on Forest monitoring forms or submitted in reports. The table below shows the number of forms or reports completed by Forest employees during FY98.

Year	*Baseline*	*Implementation*	*Effectiveness*	*Validation*	*Total*
1998	**52**	**128**	**135**	**2**	**317**

Some FY98 monitoring activities can be found in Appendix A, Page A-5. Other information has been summarized below and focuses on the changes needed at Plan Revision.

Monitoring our various sources of transportation information (i.e. hard copy maps, spatial data, the transportation database, etc.) led to the consolidation of all road data into one hard copy format that is now in an electronic, GIS format. We also updated the Transportation Inventory System (TIS) database to include up-to-date road information. The Infrastructure (INFRA) database was populated with trails data. We can better support resource management needs with this up-to-date information.

Fifteen miles of Forest routes were obliterated. This was the result of monitoring routes for resource damage and/or identifying routes no longer needed for Forest resource management.

Monitoring activities resulted in the reconstruction of the Sitting Bull Falls Recreation Area. In response to safety and health issues, this recreation area now has potable water, access for the disabled, a new parking lot, and hand rails. Trails located to protect plants and rare animal species, and the parking lot and railing designed to minimize other resource damage, are being monitored for effectiveness.

Recreation sites were monitored to determine condition and value. Two districts began the "meaningful measures" process which will result in detailed site information and deferred maintenance cost estimates.

The Sacramento Ranger District is using surveillance plots on their commercial timber sales. These are a critical part of our timber theft prevention program.

Thirty-three known sites were monitored for possible disturbance of artifacts. Site monitoring before and during implementation phases of road or project work helped to avoid disturbance.

The need for baseline riparian information led to a riparian inventory contract in FY98. A watercourse ecosystem corridor inventory (over 5,000 acres) was completed Forest-wide. This information will be converted to GIS in FY99 and will be used in completing the Wild and Scenic River Assessment.

Monitoring, analysis, and planning continued on 124,000 acres of the Sacramento Fuels Reduction Project (S4 Wildland Urban Interface).

Baseline monitoring was completed on 6,000 acres on the Ruidoso Fuels Reduction project. Fuels reduction treatment was accomplished through 485 acres of mechanical treatment and 70 acres of fire treatment.

Nine Range Environmental Assessments (EA) were completed and an allowable-use monitoring system to manage forest health and forage issues was implemented.

Approximately 88,000 acres of rangeland were monitored and evaluated for trend and utilization. Where necessary, changes were made to both long- and short-term on-the-ground management.

Inventories were conducted for TE&S on over 10,000 acres.

In FY98, 1,500 acres were inventoried for the Cloudcroft Checkerspot butterfly. The inventory resulted in modifications to proposals on the Pines Campground and Village Land Exchange projects.

In January 1998, Noxious Weed Monitoring Plan reports were submitted for both the Sacramento and Smokey Bear Ranger District. Both implementation and effectiveness monitoring led to adjustments in treatment and communication methods. Approximately 2,452 acres of noxious weeds were treated during FY98.

Approximately 45,065 acres were inventoried for vegetation type and condition. Also see Appendix C, Excerpt from the GAO Study, February 1998, for other forest health monitoring information.

Based on Monitoring Results, Progress Made Moving Toward Desired Future Conditions.

Pages 11 to 14 of the Forest Plan contain the major goals for management direction of Chapter 4. The Plan defines a goal as a "concise statement of the state or condition that a land and resource management plan is designed to achieve. A goal is usually not quantifiable and may not have a specific date for completion." (36 CFR 219.3). This section summaries Forest Plan goals. (See Appendix B for Forest Plan goals.)

Social

Major social goals for the Lincoln National Forest Plan include: managing for a variety of developed and dispersed recreation experiences; providing a system of roads and trails for motorized recreation use; providing wild caving experiences; protecting and managing heritage resources; emphasizing visual resources; managing for a favorable flow of water for users; protecting life, property, and resources from wildfire; and responding to public needs for access through and use of National Forest lands.

Although social trends have shifted emphasized use from commodity to amenity, Plan implementation has been dynamic and has allowed us to meet most of the social shifts from the time the Plan was written. Trends for which the Forest has not been able to shift adequately to satisfy our diverse publics are easily identified through recent litigation.

A variety of developed and dispersed recreational opportunities has been enhanced through the reconstruction of the Silver Amphitheater; Three Rivers and South Fork Campgrounds; Sitting Bull Falls day-use area; School House and Cedar Creek picnic grounds; and developed recreation sites such as the Windy Point and Haynes Canyon vistas. Many of these facilities have been redesigned to accommodate accessibility for an older-aged population of Forest users. This includes: higher road-maintenance levels, improved signing, and facility parking lots designed for larger recreation vehicles. The Trestle Recreation site is in close proximity to the Mexican Canyon Trestle and is an interpretive site for the Cloud-climbing Railroad of the early 1900s.

The Lincoln's transportation system improvements are a result of: utilizing partnerships with counties to increase management effectiveness; using RS 2477 opportunities to share maintenance activities and change jurisdiction of roads when requested by counties; working to provide safer and faster access to Timberon (Sacramento River Road project); and coordinating with Alamogordo-area residents to assess access through newly developed private land holdings.

Wild caving opportunities increased as a result of higher public visibility of the program, a Forest-wide Cave Management Plan, and recent opportunities to implement partnerships in lieu of fee programs.

Twenty-eight sites have been listed on the National Register of Historic Places. Interaction with American Indian Tribes has increased through consultation with the Mescalero, Hopi

and Zuni Tribes. The Mescalero Tribe's addition of an historic preservation officer has resulted in a more visible interest in traditional cultural properties on the Forest.

Managing the wildland-urban interface has been emphasized and programs have been established with Ruidoso and Cloudcroft. The interagency Lincoln Zone Dispatch continues to serve the Lincoln and surrounding areas with wildfire suppression resources in partnership with the National Park Service, Bureau of Land Management, Bureau of Indian Affairs, and New Mexico Forestry Division.

The Lincoln's partnership with Cloudcroft is achieving other land-use goals. Cloudcroft has been granted Townsite Act designation for about 180 acres of National Forest System lands adjacent to the Village. The suitability of these lands for change of ownership is being assessed. The Sunspot Visitor Center was designed and constructed through interagency and community coordination. In addition, we completed a land exchange with the Cloudcroft Schools for school expansion.

FY98 Progress

Monitoring of the Forest Safety and Health program identified needs for safety inspections and employee training. Action taken includes: hosting an OSHA 600 safety course for supervisors, initiating a confined space and noise protection program, and performing a safety inspection walk through on all units.

The Smokey Bear Ranger District produced the video "Restoring the Promise" collaboratively with NM State University and Natural Resource Conservation Service (NRCS) to promote watershed restoration. Video produced by the Forest are used in the curricula at NMSU, University of NM, Texas Tech, Utah State University, Eastern NM University, and others.

Economic

Major economic Forest Plan goals include: producing livestock forage; encouraging opportunity for the private sector to meet part of the recreation demand; accommodating energy and minerals exploration and development; providing opportunities to satisfy the local demand for Forest resources; providing a sustained yield of quality timber and fuelwood; and authorizing permits for private and commercial use of National Forest land when private land is not available.

Recreation and tourism has increased and boosted the economies of Cloudcroft and Ruidoso. The Trestle Recreation Area, vistas, and the Sunspot Visitor Center are examples of facility improvements that have enhanced tourism and brought dollars into the communities.

The quality and quantity of the fuelwood has been maintained near to the expected Plan level. However, supply for sawtimber products has not met Plan expectations. Sawtimber volume has decreased to one or two million board feet per year which is well below the allowable sale quantity of 15 million board feet. The causes for this discrepancy are

discussed in this report. White Sands Forest Products of Alamogordo has been greatly impacted.

Oil and gas leasing has increased on the Guadalupe Ranger District and is showing a direct financial return to the counties.

Ecological

Major ecological Forest Plan goals include: minimizing impacts of insects and disease on resources, perpetuating aspen species, allowing fire to play a natural role, managing air quality in conformance with the Clean Air Act, providing for a diversity of plant and animal species, improving habitat for threatened and endangered species, providing for management of sensitive species, bringing permitted-grazing use in balance with forage allocated for use by domestic livestock, preserving and protecting cave resources, maintaining water quality and quantity, maintaining site soil loss within established tolerance levels, and managing riparian areas to provide optimum vegetation and ecological diversity.

Forest Plan goals for forest health, especially treatment for insects and disease, have not been met. The mixed conifer and ponderosa pine forests continue to display unnaturally high levels of infestation due to historic lack of natural fire and more recent lack of silvicultural treatments. These forest conditions present a threat of catastrophic wildfire and increased insect and disease occurrence over broader landscapes. Progress has been made in the woodland and grassland ecosystem through the reintroduction of fire.

New species have been listed as threatened or endangered since Plan implementation, and these species are being protected through project design. Five plant and four animal species have recovery plans that provide direction to enhance their habitats. The Forest has consulted with the U. S. Fish and Wildlife Service on all species that affect Forest Plan direction on listed species. Proactive management, and coordination with universities and the U. S. Fish and Wildlife Service have prevented the listing of several species, such as the Sacramento Mountain salamander.

Improved range conditions have resulted from the implementation of structural and nonstructural improvements, and more intensive management developed in allotment management plans. The Burns Amendment schedule will help continue this type of improvement. However, these actions are sometimes negated. For example, increased pinyon/juniper canopy closure and the resulting degradation of watershed function decreases range conditions.

Watershed condition has been improved through the reintroduction of fire and woodland thinning projects. Road obliteration and road closure has helped restore watershed function through soil stabilization and vegetation establishment. Roads have been moved out of bottomlands where feasible and riparian function has been improved with structural and nonstructural improvements. Proper functioning condition of watersheds has been assessed for a number of watersheds, and is ongoing.

FY98 Progress

Ski Apache, Mescalero Tribe, and the Rio Ruidoso River Association cooperated in treating soil erosion and water quality issues on both land ownerships.

Range allotment, pasture, and constructed features information has been converted to a GIS format to better support livestock management analyses and needs.

Implementation of the Sunspot Salvage sale on 500 acres provided fuels protection around Sunspot National Observatory.

About 485 acres were mechanically treated and 70 acres treated with fire for fuels reduction.

The Sacramento RD treated approximately 370 acres mechanically and 1000 acres by fire.

Approximately 26,000 acres (23,000 U.S. Forest Service and 3,000 Bureau of Land Management) were treated by prescribe fire to restore watershed health and reduce hazardous fuel accumulation.

Research Needs

Ongoing Activities with the Rocky Mountain Forest and Range Experiment Station

A strong partnership has formed between the Lincoln National Forest and the Rocky Mountain Experiment Station. In some instances, the Forest is only an indirect partner, providing support to studies initiated by other agencies such as the study of noise impacts from low-level helicopter overflights on Mexican spotted owls, funded by Holloman Air Force Base (approximately $500,000). For this study, scientists specially designed the project to include analysis of chain saw noise for future application to management on the Lincoln. The following are some of the recently finished or ongoing studies being conducted on the Forest:

- Mexican spotted owl prey ecology, Sacramento Mountains
- Habitat use of Mexican spotted owls
- Replacement of the Continuous Forest Survey with establishment of study plots on a 5,000 meter grid across all ownerships within the National Forest boundary
- Effect of small-scale disturbance on prey of the Mexican spotted owl in the Sacramento Mountains
- Ecological analysis of old-growth montane conifer forests of the Sacramento Mountains
- Ecosystem needs assessment
- Hazard rating of Southwestern white pine blister rust
- Site and stand factors associated with the occurrence of roundheaded pine beetle outbreaks in Ponderosa pine
- Reconstructing forest history in mixed conifer and adjacent forests, Sacramento Mountains
- Decay dynamics and ecology in the mixed conifer ecosystem of the Sacramento Mountains
- Regional dendroecology research
- Area application of Verbenone to reduce the mortality of Ponderosa pine by roundheaded pine beetle in the Sacramento Mountains
- Study noise impacts on Mexican spotted owls from low-level helicopter overflights
- Mexican spotted owl distributions in relation to human activities in the past decade: an analysis of accommodation on two 7.5 minute quadrangles

Informal information sharing occurs between scientists and Lincoln personnel, especially at the district level. Additional technology exchange occurred when Dr. Claudia Regan, Dr. Merrill Kauffman, and Laura Huckaby gave formal presentations to the Lincoln's managers and specialists. Their presentations on Sacramento Mountain projects included: the ecological analysis of old-growth montane conifer forests, ecosystem needs assessment, and reconstructing forest history in mixed conifer and adjacent forests.

Summary of Ongoing Activities with Universities

University research projects are also conducted on the Lincoln National Forest. The Lincoln may be directly involved by contributing to project design, funding, or providing personnel or facilities. In other cases, the Forest may only be indirectly involved by processing the appropriate permits which enable projects to occur on National Forest land. The following projects include both direct and indirect university research occurring on the Forest.

Through a cost-sharing agreement with Texas A&M, herpetology baseline information has been collected for Last Chance Canyon.

For the Cloudcroft Area Sustainable Tourism (CAST) program, New Mexico State University completed and analyzed three surveys involving residents, commercial users, and National Forest users. The purpose of the survey was to ascertain tourism trends, resident attitudes toward tourism, and economic impacts. The University of Wisconsin and the University of Colorado are currently working on the CAST program. This partnership received a national grant of $5,000 through the Rural Community Assistance Program.

The Southeast Experimental Station at Clemson University is working on a National Recreation-use Survey on the Smokey Bear Ranger District. The District is one of 30 districts throughout the U. S. participating in this survey. The objective is to develop statistically sound ways of reporting visitor numbers for the National Forest System.

The University of Colorado is working on a paleontology project on the Guadalupe Escarpment. The project involves excavating the cave sediment to analyze the bones and charcoal. This project is helping the Lincoln to describe the ecology of the area for the past 9,000 years.

The Gonzaga University is conducting a study on the salamander, Aneides Spp. The study is of the hormonal influence on morphological evolution.

New Mexico State University graduate students are working on projects involving calculating the growth of pinyon pine in the pinyon-juniper woodlands and studying soils respiration in the Agua Chiquita area.

The University of New Mexico (UNM) is working on a project which injects tracers and studies the results of surface water to ground water interaction on the Rio Penasco. UNM and Rocky Mountain Forest and Range Experiment Station conducted a conservation assessment of the Sacramento Mountain salamander.

Information Needs

Information needs for the Lincoln National Forest occur at multiple scales, from landscape to organism. The following are relationships, processes, and species about which more or better information would greatly enhance management of the Forest.

- How do motorcycles affect Mexican spotted owls?
- What are the landscape effects of white pine blister rust? Are there individuals or groups with resistance? Can resistance be created through genetic manipulation?
- How are Rocky Mountain elk using the landscape and how do they affect other plants, animals (willows, cows) and systems (riparian)?
- What are the historic fire regimes and how does fire affect all landscapes, from alpine to xeric (especially riparian)?
- What are the best trail building materials to improve accessibility for users with disabilities.

- To help restore natural fire into the Sacramento Mountains, what behavior, affects, and prescriptions for fire are needed for mixed conifer forests (75% of Lincoln commercial-forest land)?
- What monitoring techniques can help us to best implement the requirements of the Mexican Spotted Owl Recovery Plan? (We need micro-monitoring of habitat changes and macro-monitoring of population changes.)

Research Needs Defined in FY98

Scoping and analysis of recent proposed management actions in the Sacramento Mountains have heightened the Forest's awareness of the need for more information on several localized species of butterfly.

Cloudcroft Checkerspot butterfly:
- What habitat does this species use during the winter?
- What are the key plant species used by the caterpillar?

Cloudcroft Silverspot butterfly:
- What are the key plant species used by the caterpillar?
- What is the appropriate survey protocol for this species?

Discussion of Barriers to Effective Monitoring and Evaluation

The predominant barriers overriding effective monitoring and evaluation have been higher priority work and a perceived lack of funding. Another barrier has been the perception that monitoring includes only complex, scientifically designed, and rigorously evaluated activities. Many of the monitoring activities we have institutionalized are not recognized internally as monitoring. These perceptions are compounded because there has not been a Forest, Regional, or National strategy which clearly and efficiently links existing efforts or identifies stratified actions which could serve multiple organizational or resource levels.

Emerging Issues and Important Social and Resource Trends, and Discussion of Planned Monitoring and Evaluation Efforts Designed to Address Them.

Issues Being Litigated

The Lincoln National Forest is currently involved in Region-wide litigation but no Forest-specific litigation.

National Forest Management Act Consistency - In December 1996, the Forest Guardians and the Southwest Center for Biological Diversity brought suit against the Forest Service. The suit alleged the implementation of the standards and guidelines of forest plan amendments, that became effective June 1996, should be applied retroactively to all forest plan implementation decisions. The District Court ruled the Forest Service had the discretion to apply new standards and guidelines proactively. In July 1997, the same plaintiffs appealed the Court's decision and the Ninth Circuit Court of Appeals issued an injunction on July 25, 1997, limiting some timber and grazing activities on Southwestern Region forests. In December 1997, the Court of Appeals upheld the lower Court's ruling and lifted the injunction.

Wild and Scenic Rivers Act Consistency--Preservation interest groups have filed suit alleging several Southwestern Region forests, including the Lincoln, have failed to comply with the Wild and Scenic Rivers Act. Requested relief includes an assessment that would determine the eligibility of rivers for Wild and Scenic River designation, especially the Agua Chiquita, Blue Water Creek, Rio Penasco, Rio Bonito, and Sacramento River. Additional relief is prohibition of any management actions that may preclude eligibility of these rivers prior to completion of the eligibility assessment.

The Lincoln will analyze and determine the eligibility of the Agua Chiquita, Blue Water Creek, Rio Penasco, Rio Bonito, and Sacramento River, and other waterways for nomination under the Act.

Issues Being Appealed

The only administrative appeal in 1998 was by preservation interest groups which alleged the decision to implement a timber salvage sale and forest health treatments in the Sacramento Rim project violated the National Forest Management Act (NFMA) on the following counts: wildlife species viability, protection and restoration of water quality and watershed conditions, traditional cultural properties, demonstration of purpose and need for the project, management of lands for highest net public benefit, and need for an Environmental Impact Statement. The District Ranger's decision was upheld.

Appeals from previous years help to highlight issues which need to be closely reviewed during Plan Revision and include:

- issuing grazing permits
- requiring a permit for commercial use of Forest roads
- timber harvesting in old growth forests

- thinning pinyon-juniper woodlands using chaining

Alignment with Other Agencies

On Forest rangelands, competition between elk foraging and livestock grazing is an emerging issue. The issue involves the appropriate population size of elk and the assessment of elk forage in determining livestock grazing capacity. The Lincoln National Forest, and the New Mexico Game and Fish developed agreements and guidelines on habitat management for a number of key species during Plan development. These guidelines are the topic of ongoing meetings between the Forest and Department of Game and Fish, and will provide information for determining elk numbers and forage utilization.

National/Regional Scale

A number of trends are occurring in the Southwest that affect Forest Plan direction, goals, and objectives. Demographics are shifting to an older-aged population, and there will be a continually increasing influx of people of all ages from outside the area. This trend includes an overall transition from a public which desires commodity-oriented products and services, to a public which wants programs and program delivery to be amenity-oriented. Results of this shift include an increase in the kind and number of recreation opportunities, accessibility to all publics, and an ever-increasing sensitivity to macro- and micro-environmental issues.

This shift in demographics indicates that Lincoln National Forest customers are changing in terms of what they want, expect, and need from programs delivered. At issue is the need for the Forest Service to re-assess who those customers are and how best to serve them. The Lincoln's customers include people from New Mexico, West Texas (including El Paso), and Mexico.

With this anticipated influx of people, comes the resource infrastructure necessary to support increased populations, especially in desert environments of the Southwest. Sustainability of regional hydrogeologic systems is an emerging issue which must be assessed. Management strategies to maintain sustainability must be developed and implemented. For the Lincoln, this assessment must include the hydrogeologic systems which support the growing population needs especially within the Alamogordo, Ruidoso, and Pecos River watersheds.

Improving forest health is an issue which includes preparing some landscapes for the reintroduction and restoration of natural fire into the ecosystem. At issue are identifying geographic areas where this can be done within allowable risk, gaining acceptance of our stockholders, and developing the strategy and tools to successfully implement that strategy. Other related issues include:

- How can we restore natural fire and maintain State smoke management standards?
- How can we minimize smoke-related impacts to urban and rural publics?

Local Scale

Wildland-urban interface - Improving the wildland-urban interface is an issue which is being addressed now, and will continue. The mountain communities of Ruidoso and Cloudcroft, and a number of other subdivisions surrounded by forests are at high risk of catastrophic wildfire. Public awareness programs are ongoing, and implementation strategies are being developed. Safely restoring natural fire into adjacent ecosystems is a part of the long-term solutions which need to be developed.

> Landscape analyses, including vegetation surveys to identify priority treatment areas, are being performed for high priority wildland-urban interfaces on the Smokey Bear and Sacramento Ranger Districts. Heritage resource information is being gathered through landscape and project-level surveys.

Forest Health - In addition to historic suppression of natural fire in the Lincoln National Forest, a number of forest insects and diseases have contributed to the vulnerability of the Forest to catastrophic wildfire. Natural change agents such as dwarf mistletoe, spruce budworm, white pine blister rust, and bark beetle appear to be occurring at rates higher than that of a healthy forest environment.

> Vegetation surveys continue to be completed to help identify priority areas for analysis and treatment. This information also needs to be used to help identify and map old growth. Rocky Mountain Forest Range and Research Station conducts a host of research projects on the Lincoln, including the most recent white pine blister rust project.

Watershed and Riparian Health - Key to a sustainable healthy forest ecosystem are properly functioning watershed and riparian systems. Historic railroad logging across watersheds and settlement activities, (such as farming) in riparian areas, significantly altered these systems in the early 1900's. Although most of these systems have recovered remarkably, many still need improvement to regain their full natural function. Related issues emerging on the Lincoln include:

- identifying and managing water rights
- restoring fisheries functions where appropriate
- improving and maintaining water quality

> Surveys were completed to identify the location and condition of existing riparian areas. Properly functioning conditions are also being assessed. For key projects, baseline water quality information is being collected.

Collaborative Stewardship - Collaborative work with local partners has emerged as a priority issue over the past few years. Lincoln and Otero Counties have implemented Land-use Plans and established Public Land-use Advisory Committees. These groups frequently interact with the Forest at strategic and project levels. High emphasis is placed on collaboration and is demonstrated by memorandums of understanding focused on NFMA and National Environmental Policy Act (NEPA) planning between the Forest, and Otero and Lincoln Counties. Other collaborative efforts evolving from this issue include the Cloudcroft Area Sustainable Tourism and the Cloudcroft Townsite designation. New partnerships are breaking some traditional barriers to collaborative stewardship. Other related emerging issues include:

- identifying and addressing needs of growing communities in and adjacent to the Lincoln National Forest
- continuing to deliver programs which balance amenity, commodity, and life-style needs
- developing effective relationships with the Mescalero Apache Tribe
- expanding of military-use areas that may conflict with the needs of local communities
- increasing cave research for medical purposes

The Lincoln has identified many key community contacts and continuously conducts informal monitoring through personal contacts. Past monitoring include formal interviews with these partners and documented feedback. At a minimum, formal annual meetings are held with County leaders to exchange information and discuss planned projects.

Transportation System - Access to and within the Lincoln National Forest is an issue which continues to become more complex. Differing missions and perspectives of multiple agencies involved in rockfall protection along U. S. Highway 82 elevated visual resource management as an issue. A number of monitoring and evaluation trips were conducted in an effort to resolve this issue.

Changing social conditions in the community of Timberon led to a Federal Highway Administration improvement project on the Sacramento River Road. Since implementation of the Plan in 1986, this road has become the major thoroughfare to Timberon and has been described by many of its residents as a safety hazard. In addition, the road has become a school bus route for Cloudcroft Schools. Implementation of the proposal may require a Plan amendment. This amendment has been drafted and is under consideration of the US Fish and Wildlife Service, Federal Highway Administration, and Lincoln National Forest. Other transportation issues include:

- The accessibility to all users needs to be improved through improved road and trail systems management.
- Off-highway vehicle use is increasing and needs to be addressed.
- With the aging population, there is an increased need for higher maintenance levels of Forest roads.
- Trends are toward more and better signing.
- Lands adjacent to the Forest boundary, especially Alamogordo, are being developed as residential subdivisions and some traditional access to the Forest is being denied along these interfaces.
- Demand for rights-of-way across Forest land is increasing.
- Jurisdictional questions of many roads are being resolved (e.g. RS 2477) but many remain at issue.

Recommendations

APPENDIX A

FOREST PROJECT MONITORING EFFORTS

In February 1998 and in response to a Government Accounting Office (GAO) Study, Forest Health monitoring efforts for fiscal years 93 - 97 were summarized in the following format. Many of these projects are monitored over a period of several years--some into FY98.

All FY98 project monitoring activities submitted by Forest employees have been summarized and can be found starting on Page A-4.

PROJECT	TYPE OF MONITORING	PURPOSE
FY93		
Canyon Prescribed Burn	Effectiveness	Determine if fuels reduction objectives were met.
Pinyon Prescribed Burns	Effectiveness	Monitor results of reducing natural and activity fuels in the canyon area.
Commercial Fuelwood Areas (Four areas)	Implementation	Determine if density objectives have been achieved. Contract administration (PJ woodland)
Carrizo Demonstration Area	Implementation	Monitor mechanical vegetation removal activities.
	Effectiveness	Determine if residual fuel loading meets desired conditions. Second visit to monitor revegetation after burn.
Poison Timber Sale	Effectiveness	Determine whether the environmental concerns in the Environmental Assessment were addressed adequately on the ground. These concerns included: reducing future timber losses from insects and disease by improving overall forest health.
Sacramento Salt Flat Ecosystem Management (EM) Area	Baseline	Re-identify photo points set in 1920, establish new points for aspen stands, take photos of noxious weeds, riparian areas, and Nelson Vista. Establish a photo point layer in GIS to track resources and changes over time (Mixed conifer).
Gage Timber Stand Improvement	Effectiveness	Review application of silvicultural prescriptions to achieve dual objectives of mistletoe suppression and stocking control caused by incomplete overstory treatment under the Gage Timber Sale (Mixed conifer).

Scott Able Timber Sale	Implementation	Review logging operations and activity for compliance with objectives and mitigation measures identified in the EA (Mixed conifer).
Westside Mistletoe Treatment	Effectiveness	Scheduled monitoring with Regional Office (RO) Insect and Disease Control. Were project objectives met? Have the instances of mistletoe infestation decreased? (PP)
Sacramento River Area	Baseline	Visual observations of tiger moth populations.
Denny Hill Planting Project	Effectiveness	Determine if success rate is acceptable, monitor tree growth.
Gavilan Fuelwood	Implementation	Review the project as it related to Goshawk guidelines and proposed fuel treatments.
Patos Mountain Wildlife	Implementation	Inspect progress of cutting crew to see if the density/stocking objectives were being met.
Post-sale exams (various)	Effectiveness	Monitor effectiveness of silvicultural prescriptions associated with timber sales.
Westside Wildlife Opening	Effectiveness	Scheduled monitoring with RO Insect & Disease Control. Determine if project objectives were met. Evaluate project development process.
FY94		
Benado Gap Burn	Effectiveness	Burn results. Effect on snakeweed.
Patos Mountain/Big Rocks Fire	Effectiveness	Review damage to private land and offer rehabilitation suggestions.
Patos Mountain/Pancho Canyon Fires	Implementation	Review safety, Forest Plan compliance, resource protection, wilderness, private property reviewed for protection and coordination.
Texas Park Fuelwood	Effectiveness	Review results of cutting.
Commercial Fuelwood Areas (Five areas)	Implementation	Contract administration. Review of methods.
Sacramento Watershed Bridge Fire Rehabilitation	Effectiveness	Check effectiveness of structural rehab measures, observe plant growth, and other watershed effects of Bridge Fire.
Bridge Fire	Baseline	To establish monitoring video and still photo points and retake pictures of the area taken in 4/93.
	Implementation	To determine extent of resource damage.
Little Apache Timber Sale	Implementation	Review fence removal project.
Dry Burnt/16 Springs	Effectiveness	Evaluate effectiveness of

		removing/preventing mistletoe infestations.
	Baseline	To determine if an area proposed was suitable for mistletoe treatment.
Dry Burnt Salvage	Effectiveness	Review contract effectiveness and EA compliance.
Burgett Wildfire Rehabilitation	Effectiveness	Assess the success of seeding efforts and natural regeneration of vegetation in the fire area 16 months after the fire.
James Canyon Campground	Implementation	Check status of crew's progress of hazard tree removal.
FY95		
Sikes (Six projects)	Effectiveness	Review and exchange information and ideas on Sikes Habitat Improvement projects
Eagle Creek Sikes	Implementation	Determine how to speed up work progress.
Block Sikes	Implementation	Inspect contract work.
Gavilan Ridge Sikes	Effectiveness	Review improvements, determine effectiveness.
Salado Area	Implementation	Monitor progress and conditions of tree removal.
Cook & Waterhole Canyons Fuelwood	Implementation	Sale administration. Observe musk thistle.
Lone Tree Sikes	Implementation	Monitor project progress.
Patos Fire Complex	Baseline	Determine damage from rain and examine success of emergency fire rehab efforts.
Personal Fuelwood Areas (Six areas)	Implementation	Monitor progress towards achieving density objectives.
Prather Canyon Burn	Effectiveness	Determine results of burn project.
Ranger Timber Sale	Implementation	Check road-closing area.
Sacramento River EM/Bridge Fire	Effectiveness	Observe if insect life in the Sacramento River was impacted by the Bridge Fire, above and below the community of Timberon.
EM Area - S3/Burgett Planting	Effectiveness	Assess condition of planting that occurred in the 4th quarter of FY94 and 1st quarter of FY95.
Bridge & Burgett Burns	Effectiveness	Review and evaluate past Burned Area Emergency Rehabilitation (BAER) treatments, seeding, log contour felling, channel check dams.
Westside EM Area - S1 and the Potato Knob Timber Sale	Effectiveness	Assess mistletoe project. Review effectiveness of silvicultural prescriptions.

Ranger Timber Sale Thinning Project	Implementation	Assess crew's progress and applications of prescriptions.
Sacramento Mountains	Baseline	Examine the recent outbreak of white pine blister rust on the southwestern white pine.
Dark Canyon/Fritz Pole Sale	Implementation	Observe the progress of the pole sale and the recovery of the burn area.
Dark Canyon Thinning	Implementation	To review cutting procedures, safety and results.
EM Area - G2, Shattack Watershed Treatment Area	Effectiveness/Validation	Discuss thinning prescriptions and affects, monitor affects of treatment.
FY96		
Commercial Fuelwood Areas (Six areas)	Implementation	Check progress. Contract administration.
Personal-use Fuelwood Areas (Six areas)	Implementation	Monitor fuelwood areas and Sikes.
Carrizo Sub-watershed/Patos Burn Complex South	Effectiveness	Check stability of major drainages.
Carrizo EM Area/Salado Sub-watershed	Effectiveness	Follow-up from previous 1995 visit to check vegetation management.
Benado Gap/Patos Sikes Act	Baseline	Look at proposed burn for fuels and existing condition.
Hale Lake Sikes	Baseline	Look at project site and layout.
Gavilan Ridge Sikes	Implementation	Review of cutting, road condition, wildlife habitat and trick tanks.
Eagle Creek Sikes, Personal-use Fuelwood	Effectiveness	Observe cutting and road conditions.
Jicarilla/Rico Fuelwood	Implementation	Look at area and sale layout to produce fuelwood for public and commercial use.
Salado Sub-watershed Push	Effectiveness	Check ground cover condition and wildlife use in vegetation management project.
Salado sub-watershed Herbicide	Implementation	Check conditions of herbicide treatment.
Patos Burn Rehabilitation	Effectiveness	Check stability of major drainages.
Little Apache and Ranger Timber Sale Areas	Baseline	Check ground cover conditions.
Dark Canyon Vegetation Treatment	Effectiveness	Share information with the Supervisor's Office (SO) and Regional Office (RO) visitors, and observe development of grass under slash.
South Divide Sikes	Implementation	Check cutting units.
Animal and Plant Health Inspection Service	Baseline	Gypsy moth detection.

FY97		
Bunk House Thinning	Implementation	Check thinning and chipping project progress, spacing, and safety.
Commercial Fuelwood Areas (Six various areas)	Implementation	Contract administration and percent completion.
Benado Gap	Effectiveness	Observe resource restoration work and project effectiveness.
	Validation	Observe treated versus untreated area.
Personal-use Fuelwood Areas (Six areas)	Implementation	Monitor use.
Gavilan Ridge Sikes	Implementation	Monitor fuelwood sales, trick tanks, road condition, and off-road travel.
Lone Tree Sikes	Implementation	Monitor burn results.
Lower Eagle Creek Sikes	Implementation	Project review.
Block Wildlife	Effectiveness	Look at Phase 1 thinning.
McDonald Lake Thinning & Bluewater Fuelwood	Implementation	Flag for avoidance and monitor archaeological sites.
McMoore & Sunspot Salvage Sales	Implementation	Archaeological site monitoring.
State Route 137 Rights-of-Way (ROW)	Baseline	Evaluate vegetation removal from SR 137 right-of-way.
EM Area - G2, Dark Canyon	Implementation	Review prescription for PIPO habitat improvement.
Dark Canyon Thinning	Implementation	Review prescriptions and project with crew.
North End Burns	Baseline	Look at potential areas for prescribed burns.
Hamm Well Fuelwood	Implementation	Relocate and document recorded archaeological sites.
Patos Burn Rehabilitation	Effectiveness	Observe vegetation regeneration.

The information below summarizes documented monitoring activities submitted by Forest employees during FY98.

PROJECT	TYPE OF MONITORING	PURPOSE
FY98		
Outreach and Recruitment Plan	Implementation	Monitor use of a form created as a discussion tool for how to fill vacant positions.
Noxious Weeds Analysis	Implementation	Monitor treatment methods, and TE&S plant and animal mitigations.
Blue Lake Fuelwood, Unit 1	Implementation	Contract administration, monitor

(Three visits)		prescriptions, cutting methods, slash, and stump height.
Patos Mountain, Patos Ditch	Implementation	Monitor ditch flow changes made by the County.
Hale Lake Fence	Effectiveness	Monitor effectiveness of fenced areas to prevent dumping.
Jacks Peak, T&E Plan	Implementation	Review T&E Plan with permittees and look at road situations.
Jicarilla Hunter Access	Implementation	Monitor off-highway use and hunter activity.
Carrizo, South Divide Habitat Improvement	Implementation	Monitor implementation of prescribed fire.
Ski Apache Lift Inspection	Baseline	Oversee lift inspection conducted by insurance company inspectors.
Carrizo, Patos #3 Habitat Improvement	Implementation	Inspect and seed burned areas.
Ski Apache Repair	Implementation	Monitor interim repair measures implemented by Ski Apache within the Apache Bowl and Deep Freeze areas.
Cowboy Symposium	Implementation	Monitor trail rides associated with Cowboy Symposium activities.
Heritage Resource Site Inspection (19 sites)	Implementation	Inspect areas and flag for avoidance.
Heritage Resource Site Inspection and Reflagging (24 sites)	Implementation	Site inspection and reflagging site boundaries for forest road work.
Heritage Resource Site Artifact Monitoring (Four sites)	Baseline	Monitor for presence or absence of artifacts found in the past.
Johnson Canyon - Noxious Weeds Inspection	Implementation	Monitor musk thistle and vehicle use
- Wildlife Water Inspection	Effectiveness	Monitor three wildlife water sources.
- Dead Horse Complaint	Baseline	Validate complaint about a dead horse being hauled into the Forest.
Forest Recreation Site Visits (Several visits by office personnel)	Baseline	Supervisor's Office personnel visited the sites so they could better answer visitor questions. Monitored signing used by our publics to get to the sites.
Nogal Lake Allotment Private Land Access	Baseline	To look at proposed road needed to access private land.
Salado Sub-watershed Restoration	Effectiveness	Monitor progress of previous watershed restoration projects.
Patos Burn, North	Effectiveness	Monitor progress of burn rehabilitation.
Ox Yoke Habitat Improvement	Effectiveness	Monitor previous dozer work.
Capitan Divide Fuelwood Area	Effectiveness	Review seedling/sapling removal by Camp Sierra Blanca crew.
Benado Gap Grazing Use	Effectiveness	Monitor grazing use, watershed

		improvement, and share ideas with another ranger.
Felix Springs Fuelwood Harvest	Implementation	Monitor status of fuelwood harvest and trash cleanup. Check access into sale area and perform sale administration.
Sikes Wildlife Habitat Improvements. (73 wet and dry season visits)	Effectiveness	Monitor for usage, effectiveness, and condition.
Sikes Seep/Spring Developments. (13 visits)	Effectiveness	Monitor for condition and flow.
Sikes Riparian Improvements (25 visits)	Effectiveness	Monitor effectiveness of planting and exclosure fencing.
Sikes Stream/Fish Structures (Eight visits)	Effectiveness	Monitor effectiveness and condition to document maintenance needs.
Kudner Allotment Complaint	Effectiveness	Investigate complaint by Forest Guardians on an exclosure.
Blanchard Sub-watershed Restoration	Effectiveness	Monitor treatments, water, and presence of noxious weeds.
Skinner Allotment Review	Implementation	Review PJ push, watershed conditions, noxious weeds, and fuelwood area.
Salado Sub-watershed, Mechanical Vegetation Management Project	Effectiveness	Check effectiveness of project and take action on illegal woodcutting in the area.
North Salado Riparian	Effectiveness	Monitor condition of riparian.
Bonito AOR	Baseline	Monitor size and density of noxious weed emergence.
Charles Walker Private Land Noxious Weed Test Plot	Effectiveness	Monitor plot sprayed in 1996. Determine long-term effectiveness of spray treatment.
Lucas Canyon Trail	Implementation	Review progress of trail reconstruction.
Baca Commercial Fuelwood, Units 2 & 3 (Four Visits)	Implementation	Contract administration, monitor stump height, slash, and cutting.
Dogtown Commercial Fuelwood, Units 1-4 (20 visits)	Implementation	Contract administration, monitor cutting, stump height, and slash removal.
East Merchant Commercial Fuelwood, Units 1 & 2 (Four Visits)	Implementation	Monitor cutting activity.
Peachtree Commercial Fuelwood, Units 1 & 8 (Three visits)	Implementation	Monitor cutting progress.
Shoemaker Commercial Fuelwood, Units 1-3 (10 visits)	Implementation	Contract administration.
Salt Commercial Fuelwood, Units 1-7 (Approximately 50 visits)	Implementation	Monitor percent of cut complete, cut to prescription, and slash removal.
Tucson Commercial Fuelwood,	Implementation	Contract administration.

Unit 1 (Three visits)		
South Welch Commercial Fuelwood, Units 5 & 6 (Six visits)	Implementation	Monitor stump height and percent complete.
Vera Cruz Commercial Fuelwood, Units 3 & 4 (Nine visits)	Implementation	Contract administration.
Potato Knob, Mule Peak PJ Treatment Area	Effectiveness	Monitor vegetation after prescribed fire treatment.
Board Canyon Road Closure	Effectiveness	Monitor effectiveness of fence posts in roadway and whether public was attempting access.
Atkinson Fields, Jakes Events	Baseline/Effectiveness	Area monitored before and after two-day, 750-person event for impacts to the area.
Aqua Chiquita, Noxious Weeds	Effectiveness	Inspect musk thistle spray area and determine degree of control.
Hornbuckle and Danley Salvage Sale Areas	Effectiveness	To monitor degree of falling, skidding, and removal complete.
Apache Powerline	Implementation	Monitor hazardous tree removal along the powerline
Sunspot/Sacramento River, Sacramento Rim	Effectiveness	Monitor for meeting objectives of the sale.
Springer Springs Survey (Two visits)	Implementation	Conduct a Southwest Willow Flycatcher Survey
Scott Able T&E (Two visits)	Effectiveness	Monitor condition of Cirsium vinaceum and current levels of herbivory.
Jim Lewis, Agua Chiquita, Denny Hill, and Hay Canyon Areas	Effectiveness	Determine effectiveness of 1997 noxious weed spray project.
Perk and Blue Water Canyons Road Maintenance	Implementation	Monitor road maintenance condition and type of construction.
Brown Canyon T&E	Effectiveness	To show Cirsium vinaceum population to volunteer in preparation for herbivory monitoring.
Bluff Springs T&E	Implementation	To observe Cirsium vinaceum site
Cady Allotment Cactus Survey	Baseline	Survey for cactus, assess the potential for suitable habitat, and monitor use levels.
High Rolls Area, Pinyon Mortality	Baseline	Monitor large woodland private property adjacent to FS land for reported decline and mortality of pinyon.
Trestle Recreation Area Bypass Trail	Implementation	Monitor bypass trail constructed by the BSA Eagle Scout candidate.
National Allotment Prescribed Burn	Effectiveness	Monitor effects of prescribed burn on PJ and show the new Fire Management Officer the area for future planning.

APPENDIX B

LINCOLN NATIONAL FOREST PLAN MANAGEMENT DIRECTION

MISSION

A mission is a guiding principle toward which all activities focus and contribute. The mission of the Forest is to manage resources under multiple-use and sustained-yield principles in a way that maximizes long-term net public benefits consistent with resource integration, environmental quality, and management considerations.

GOALS

A goal is defined as a "concise statement of the state or condition that a land and resource management plan is designed to achieve. A goal is usually not quantifiable and may not have a specific date for completion" [36 CFR 219.3]. The goals necessary to achieve the mission of the Forest follow. Some of these goals will be reached during the 10-15 years the plan is in effect. Others will require longer times to accomplish, and then only if the direction contained in the plan is continued beyond the effective period.

Timber

Manage suitable timber land to provide a sustained yield of quality timber, provide a range of habitats for wildlife and visual resources, and to minimize impacts of insects and diseases on resources. Manage pinyon-juniper lands to provide a sustained yield of fuelwood. Provide fuelwood from suitable timber land as a by-product of timber management activities. Use integrated stand management concepts to direct all timber management activities.

Maintain and perpetuate aspen species through silvicultural management. Timber management activities are consistent with water quality, soil productivity, wildlife, recreation, visual, and cultural values. Specific standards and guidelines for utilization, restocking, openings, and coordination of manipulation of the vegetation resource are found in the Regional Guide, and later in this chapter under individual management area prescriptions and Forest-wide Standards & Guidelines, Activities C01, D03, E00, E03, E05-E07, P34.

Wilderness

Manage wilderness to achieve the intent of the Wilderness Act of 1964. Develop wilderness access points.

Allow fire to play a natural role.

Manage air quality in conformance with the Clean Air Act and consistent with wilderness values.

Specific standards and guidelines are found in prescriptions for individual wildernesses under Activities A03, B01, and B02.

Wildlife and Fish

Manage habitat for wildlife populations consistent with goals outlined in the New Mexico Comprehensive Plan and consistent with other resource values.

Provide for a diversity of plant and animal species through improved habitat management. Provide for the improvement of habitat for threatened and endangered species to meet the goals and intent of the Endangered Species Act of 1973.

Provide for management of sensitive species in accordance with Regional requirements.

Specific standards and guidelines are found in individual management area prescriptions and Forest-wide Standards & Guidelines under Activities C01-C03, C06, C09, C12, E00 and E03.

Range

Manage and enhance the vegetation resource and bring permitted grazing use in balance with the forage allocated for use by domestic livestock. Place all allotments under appropriate levels of management.

Produce livestock forage consistent with other resources and uses.

Specific standards and guidelines are found in Forest-wide Standards & Guidelines and individual management area prescriptions under Activities D01-D06.

Recreation

Manage for a variety of developed and dispersed recreation experiences, while maintaining the current spectrum of opportunities. Encourage opportunity for private sector to meet part of recreation demand. Provide a system of roads and trails for motorized recreation use, while protecting other resources.

Preserve and protect cave resources to provide a wild caving experience and to provide quality information and interpretive services related to this unique resource.

Protect and manage historical and cultural resources.

Emphasize visual resources through application of landscape management principles.

Coordinate with the New Mexico Natural Resources Department to contribute to goals and objectives specified in the State Comprehensive Outdoor Recreation Plan.

Specific standards and guidelines are found in individual management area prescriptions and Forest-wide Standards & Guidelines under Activities A01-A08, A10, A14, A16, A18, A21.

Minerals

Accommodate energy and minerals exploration and development while encouraging practices that protect the environment.

Specific standards and guidelines are found in the Regional Guide, Forest-wide Standards & Guidelines, and management area standards and guidelines under Activities G01-G07, G09-G11.

Water and Soils

Provide direction and support to all resource management activities with emphasis on maintaining water quality and quantity.

Secure and provide an adequate supply of water for the protection and management of the Forest. Manage for a favorable flow of water for users by improving or maintaining all watersheds to a satisfactory or higher condition.

Maintain water quality to meet or exceed appropriate standards.

Maintain site soil loss within established tolerance levels.

Manage riparian areas to provide optimum vegetation and ecological diversity.

Specific standards and guidelines are found in the Regional Guide; Region 3 Threatened and Endangered Note 23 and Hydrology Notes 11 and 14; individual management area prescriptions, and Forest-wide Standards & Guidelines under Activities F01-F05, K01, K03-K06.

Human and Community Development

Use human resource programs when possible to meet the goals and objectives for resources and activities.

Provide opportunities to satisfy local demand for Forest resources.

Lands

Use land ownership adjustment to accomplish resource management objectives and respond to public needs. Provide identifiable property boundaries.

Authorize, by means of permit, use of National Forest land by private or commercial interests when private land is not available and the requested use is compatible with other resources and activities.

Resolve unauthorized occupancy and obtain needed rights-of-way.

Specific standards and guidelines are found in the Forest-wide Standards & Guidelines and individual management area prescriptions under Activities J01-J07, J10-J15, J18 and J29.

Facilities

Provide administrative improvements to meet resource and management needs.

Work with counties and State to obtain rights-of-way (ROW) and easements as a means of establishing jurisdictional responsibility for roads.

Operate and maintain the transportation system to meet administrative, public and resource needs. Manage vehicle traffic on a designated system of roads and trails while closing routes as needed to manage and protect resources.

Specific standards and guidelines are found in the Regional Guide, Forest-wide Standards & Guidelines and individual management area prescriptions under Activities L01-L13, L16-L20, L23-L25, and J01, J02.

Protection

Protect life, property, and resources from wildfire. Use prescribed fire as a tool to meet management needs and objectives.

Apply integrated pest management (IPM) to minimize losses due to insects and diseases, emphasizing silvicultural methods.

Cooperate with State and local law enforcement agencies in the protection of the public, Forest lands and facilities.

Comply with the Federal Clean Air Act in cooperation with other Federal, State and local agencies.

Specific standards and guidelines can be found in the Forest-wide Standards & Guidelines and individual management area prescriptions under Activities P08-P11, P15, P34-P36
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APPENDIX C

FOREST HEALTH
EXCERPT From The GAO STUDY
FEBRUARY 1998

2e. ***What different kinds of monitoring of forest health conditions and of forest health project results are currently taking place and what are they designed to tell you?***

Monitoring Conducted by the Forest

In August of 1992, the Lincoln began on-site documentation of projects and activities. Most of this monitoring is conducted informally. In January of 1993, formal monthly monitoring trips were assigned to the Acting Forest Supervisor. The Acting Forest Supervisor identifies one to three projects which are reviewed in the context of implementation and effectiveness monitoring. Documentation of both District and monthly Acting Forest Supervisor monitoring trips are incorporated into quarterly and annual monitoring and evaluation reports, which are reviewed by the Forest Supervisor's staff and district rangers.

Most of the informal project monitoring is related to Implementation and is designed, in general, to tell us if the project is being implemented as intended. The second highest category of monitoring is Effectiveness, which is designed to tell us if the actions that we have taken have achieved the objectives previously determined. Information from these types of monitoring is used to adjust programs and practices to better accomplish resource management objectives in the future.

Some baseline monitoring is documented giving us information on pre-project/activity conditions. Validation monitoring is primarily conducted through the research branch although it is occasionally conducted and documented by Forest personnel. A list, by fiscal year, of informal monitoring documents on the Lincoln related to forest health conditions and/or projects can be found in Appendix A of this report.

Other formal monitoring processes related to forest health include: MAR reporting, program budget, NEPA schedule, and other resource programs. Other resource programs include TSPIRS, stand exam, post-sale exams, Cirsium, goshawk, Mexican spotted owl (MSO) and Sacramento Mountain salamander. Extensive monitoring of archaeological sites occurs to determine effects, if any, of forest health projects, and to confirm that the recommendations made in the clearance were followed. The existence and condition of riparian areas is monitored for baseline data and to note changes over time. Of these other programs, stand exams provide the most data about forest health. Stand exam information includes: the status of insect and disease activity; timber defect; environmental, wildlife and logging damage; and mortality and dead material. In 1995 and 1996 the RO supplemented the Forest stand exam program and data were collected on white pine blister rust and its alternate host Ribes spp. Approximately 1,100 points covered 10,424 acres. In 1997 the Lincoln prepared a special Monitoring and Evaluation reported related to attainment of Forest Land and Resource Management Plan goals and objectives.

Monitoring Assessment and Strategy

Although the Forest recognized the need to improve the documentation of monitoring activities and streamline the process while meeting multi-level needs, it wasn't until funds became available in FY98 that a formal assessment of monitoring became a priority and a possibility. Along with an assessment of current monitoring, the Lincoln plans to develop an effective and efficient strategy. Through corroborative efforts with constituents we will identify issues which should determine, in part, what we monitor.

Forest health has already surfaced as one of these issues. It was identified in the "CAST" project, a community sustainable development program and partnership between the U.S. Forest Service and the community of Cloudcroft.

Because unhealthy forest conditions pose a threat to the long-term sustainability of the tourism economy and quality of life for Cloudcroft area residents, the "CAST" project is following the monitoring of forest health conditions. 1996 key indicators of forest health (and for which data was collected) for this group included volume (in thousand board feet (MBF) of timber removed by salvage sales, number of acres of controlled burn for fuel reduction, work (thinning, etc.) done in the urban interface, development of an urban interface plan, status of fire hazard plan, assessment of vegetation health (impacts of disease and/or fire), and a review of annual reports available for forest health assessment.

Regionally Coordinated Monitoring

Most monitoring of insect and disease activity is provided by the Regional Office. A complete set of the results of their monitoring is compiled and sent to the Forest Supervisor's office and each District office. Regional monitoring includes:

Annual aerial surveys - Low level flights document what pests are causing damage, where they are active, how extensive and intensive is the damage, and (with data from previous years), what are the trends for each pest. In addition to reporting the results to the Forest, these data are compiled as part of regional and national Pest Conditions reports. These data are available to the Forest in Geographic Information System (GIS) format.

White pine blister rust - Two types of monitoring are ongoing for this disease. First, a series of permanent plots have been established to collect data on site conditions, monitor the spread of the disease both within and between host trees, identify canker locations (which indicates survivability), and determine mortality and initial infection dates for each plot. There are presently 12 plots which are read every two to three years.

A second project involves monitoring southwestern white pines for resistance to blister rust. In a 160 acre stand which has a high level of infection, 75 supposedly resistant trees were tagged and are reexamined every two years. In 1997 cones were collected from several of these trees and sent to a nursery. Seedlings are being grown and will be tested for resistance to white pine blister rust.

The Regional Office also coordinates with APHIS and the Lincoln in setting traps for gypsy moth detection.

Forest Inventory and Analysis - Another form of forest condition monitoring is Forest Inventory and Analysis (FIA). These are permanent plots established on a 1000-meter grid, re-read every 10 years. Data collected on these plots include many of the same measurements as taken in stand exams, such as tree and understory data, habitat type, and stand data. Traditionally these data were product oriented, and each Forest collected its own information in whatever format it wanted. The results were then compiled into statewide reports. In the past few years, money allocated for the Lincoln to conduct these inventories was spent researching the possibility of conducting these inventories through remote sensing. As a result, this Forest did not collect these data for several years.

The FIA program has recently changed. Now data are collected by a single agency using the same standards nationally. Data are more vegetation oriented to reflect the shift to ecosystem-based management. These plots were read on the Lincoln in 1997 using the new guidelines. These data are available but not finalized and compiled into meaningful reports for this GAO study. An example of this FIA data and possible uses are provided in the record.